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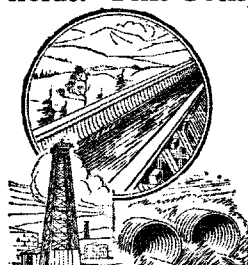
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Steel Sheets

That Resist Rust!

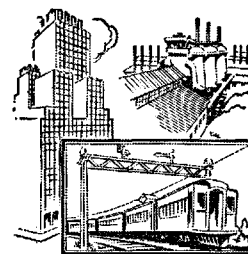
Highest quality steel sheets for the engineering, railway, industrial and general construction fields. This Company is the largest and oldest manufacturer of Black and Galvanized Sheets, Blue

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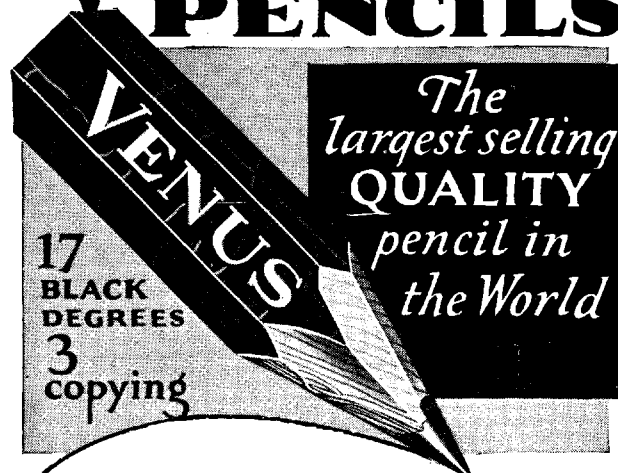


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VENUS

PENCILS



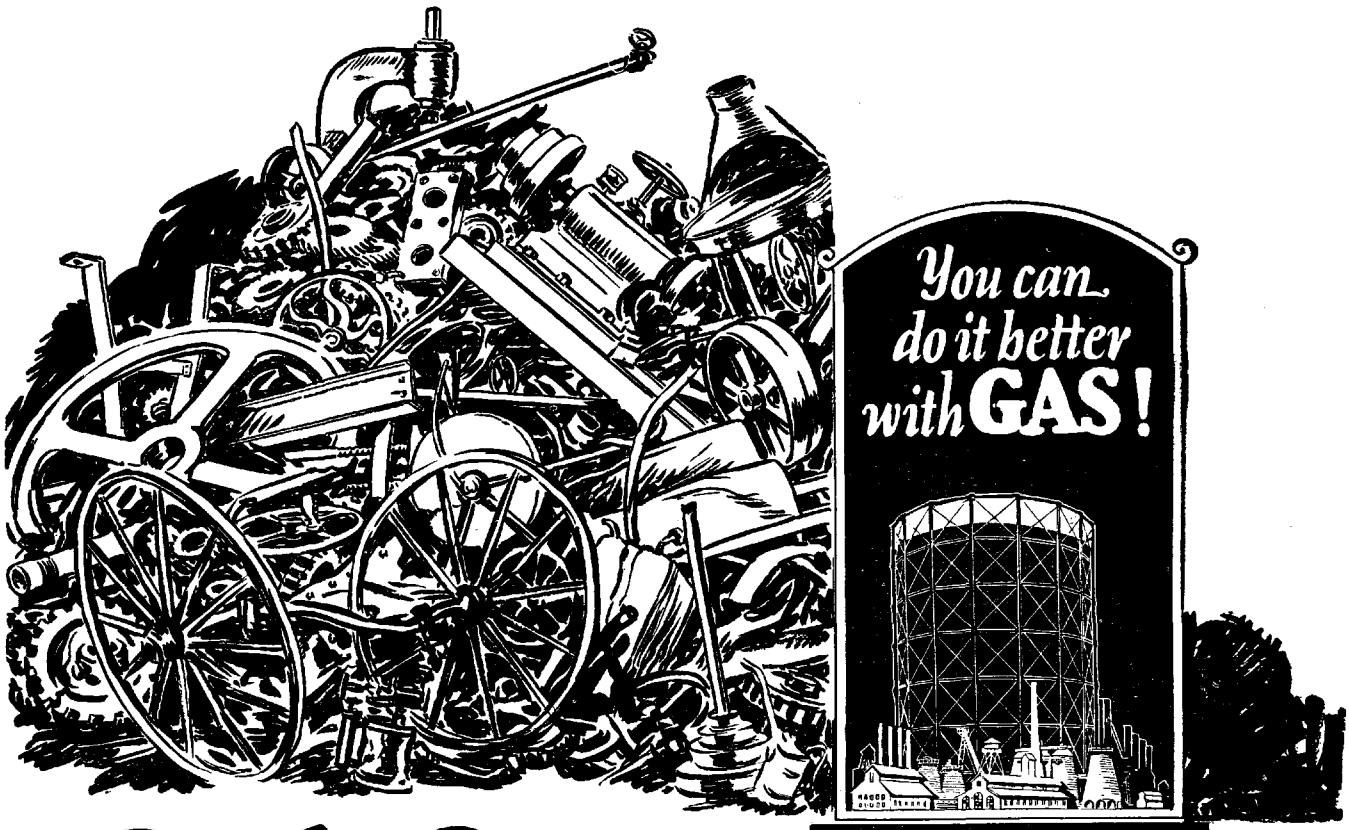
WHETHER it be the building of a battleship, or the design of a simple household article, the pencil is the first requirement—the VENUS the first pencil.

American Lead Pencil Co.

Dept. Q 11, Hoboken, N. J.
Makers of UNIQUE Thin Lead Colored Pencils. 20 Colors. \$1.00 per doz.

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GAS *in* **Industry** *modernizes time-worn methods*

It is surprising how the application of gas in industry sometimes brings about complete changes in time-worn methods. . . .

An example (which may have its counterpart in your own plant) is found in varnish making. Varnish must be heated to a definite pre-determined temperature, and removed from the heat at the precise, critical moment. Failure to observe these requirements means that the entire kettle of varnish is spoiled.

Since the industry's origin, varnish kettles have always been mounted on wheels to facilitate quick removal from the fire. But gas today is changing all that. Gas can be turned off more quickly than it

would be possible to wheel the kettle away!

Positive temperature control, made possible by gas, insures better varnish. Manpower is conserved through the use of gas. And the danger of fire—ever present by the old method—is averted.

. . . . Now consider gas for *your own* plant. Gas may or may not affect your production in these precise ways. But gas *does* hold very definite, very valuable potential advantages for you. . . . and you should know what these advantages are. Your local gas company will gladly tell you about them. Write or telephone them today.

For free copy of book, "Industrial Gas Heat", address

American Gas Association
 420 Lexington Avenue, New York City



... an empire hung
on that strap

THE hitch must be right, the pack must be tight. On details such as that hung the attainment of the day's goal and the final success of the expedition.

Lewis and Clark, first Americans to cross the continent, knew the importance of "trifles" in the concerted plan. They saw to it their equipment was right, they supervised every step from man-power to pack-horse-power, they

applied sure knowledge and constant vigilance to their task.

Today's leaders in business have the same point of view.

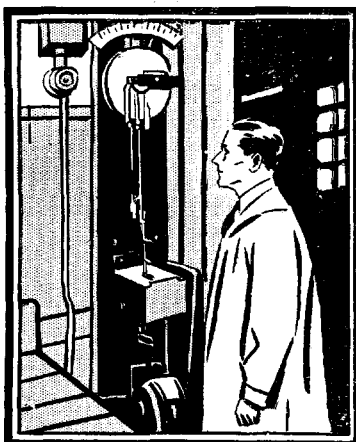
Men in the Bell System, exploring new country, take infinite pains in preparation. They work toward the smooth coordination of engineering, manufacturing, warehousing, accounting, finance, public service.

... and on many threads hangs Western Electric's world of telephone making

It may be a strand of cotton. It may be a fine-spun bit of wire. It may be a decision involving new methods of warehousing.

But tiny or great in size, in the eyes of Western Electric men no problem is ever tiny in importance. Somewhere in the Western Electric organization, somebody is studying his particular thread of the manufacture of telephones as if it were the most important thing in the world to be studied.

He may be an electrical engineer, equipped with the finest instruments of his art and the will to blaze new



Only a thread? Yes; but it may carry a world of responsibility. This cotton-testing machine determines its fitness.

pathways of knowledge.

He may be a clear-thinking mechanical engineer whose domain is the factory floor and who seeks to wrest from that domain the last final measure of effective service.

Or he may be a keen student of commercial trends, fired with the zeal to understand; and, understanding, bend the workings of commerce the better to his especial needs.

It is in this spirit that the men of Western Electric make telephones, wire, cable, switchboards—the means by which the Bell System serves the nation.

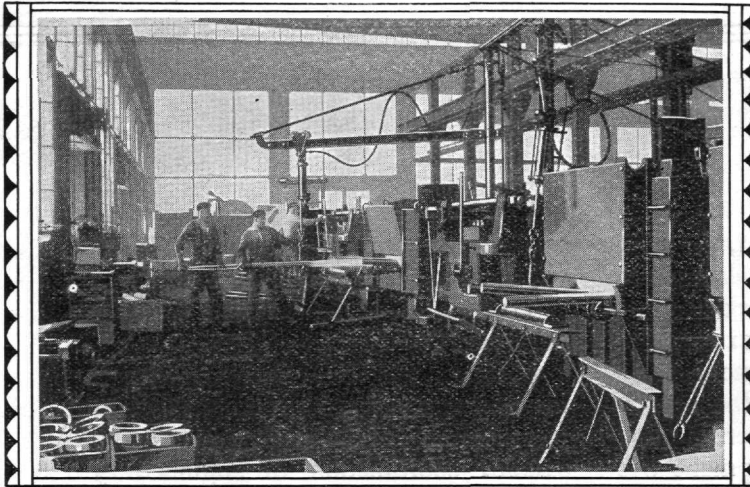
BELL SYSTEM

A nation-wide system of 19,000,000 inter-connecting telephones

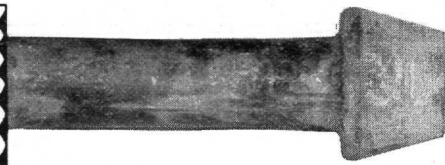


"OUR PIONEERING WORK HAS JUST BEGUN"

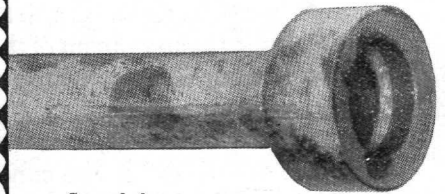
JANUARY, 1929



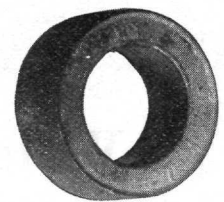
A corner of New Departure's mammoth Forge Plant — one of the largest in the world — where a unique upset forging process gives peculiar endurance to the finished ball bearing.



First form



Second form



Completed forging

Forging the Sinews of Endurance

UPSET forging plays an interesting and important part in making the New Departure Ball Bearing so enduring that it will outlive the machine in which it is installed—*and yet never wear within itself to the extent of requiring adjustment.*

This method increases the density of the steel by compression and likewise controls the flow of the steel fibre—a feature with a direct bearing on endurance life, as will be explained.

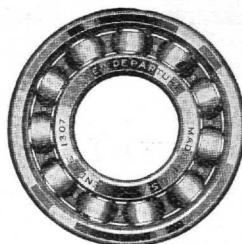
The bar is first heated to an exact temperature checked constantly by optical pyrometers to obtain a non-oxidizing atmosphere for the prevention of scaling.

The first blow of the forming die in making the

inner race ring produces the shape shown in the first form. This is immediately followed by the second operation, by which the ring is formed. The third or piercing operation cuts the ring from the bar.

Thus the fibre or grain of the steel flows into carefully predetermined channels, bringing it *parallel* to the surface at the points of greatest load in the finished and revolving bearing.

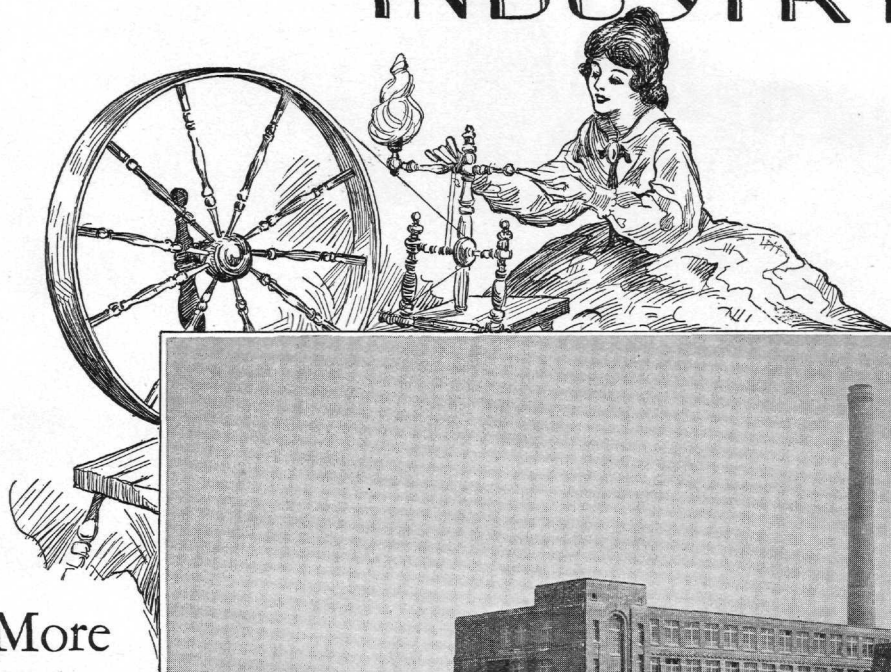
Normalizing and annealing operations which follow relieve all internal strains and greatly refine the grain size of the steel. The direction of the fibre for maximum endurance remains unchanged.



New Departure Ball Bearings

The New Departure Manufacturing Co.,
Bristol, Connecticut
Chicago • Detroit • San Francisco

INDUSTRY



More
Than a
Flight
of
Fancy



COURTAULDS, LIMITED, CORNWALL, CANADA. CONSTRUCTED BY THE FOUNDATION COMPANY

PREHISTORIC man clothed himself in the skins of the animals he killed for food. Later he used the hair alone, woven into a covering for his body, varying this with fabrics made from plants, as cotton and linen, for warmer climates and seasons.

In the far east the natives took the filament from the cocoon of the silk worm and spun and wove it into a soft and beautiful textile, much desired in Europe and America since its introduction by early seafarers.

Chemists have now produced artificially a fibre similar to the silkworm's and fabrics woven from it are produced in great quantities under the name of Rayon.

The Foundation Company has constructed a number of factories both at home and abroad, for the manufacture of Rayon.

THE FOUNDATION COMPANY

CITY OF NEW YORK

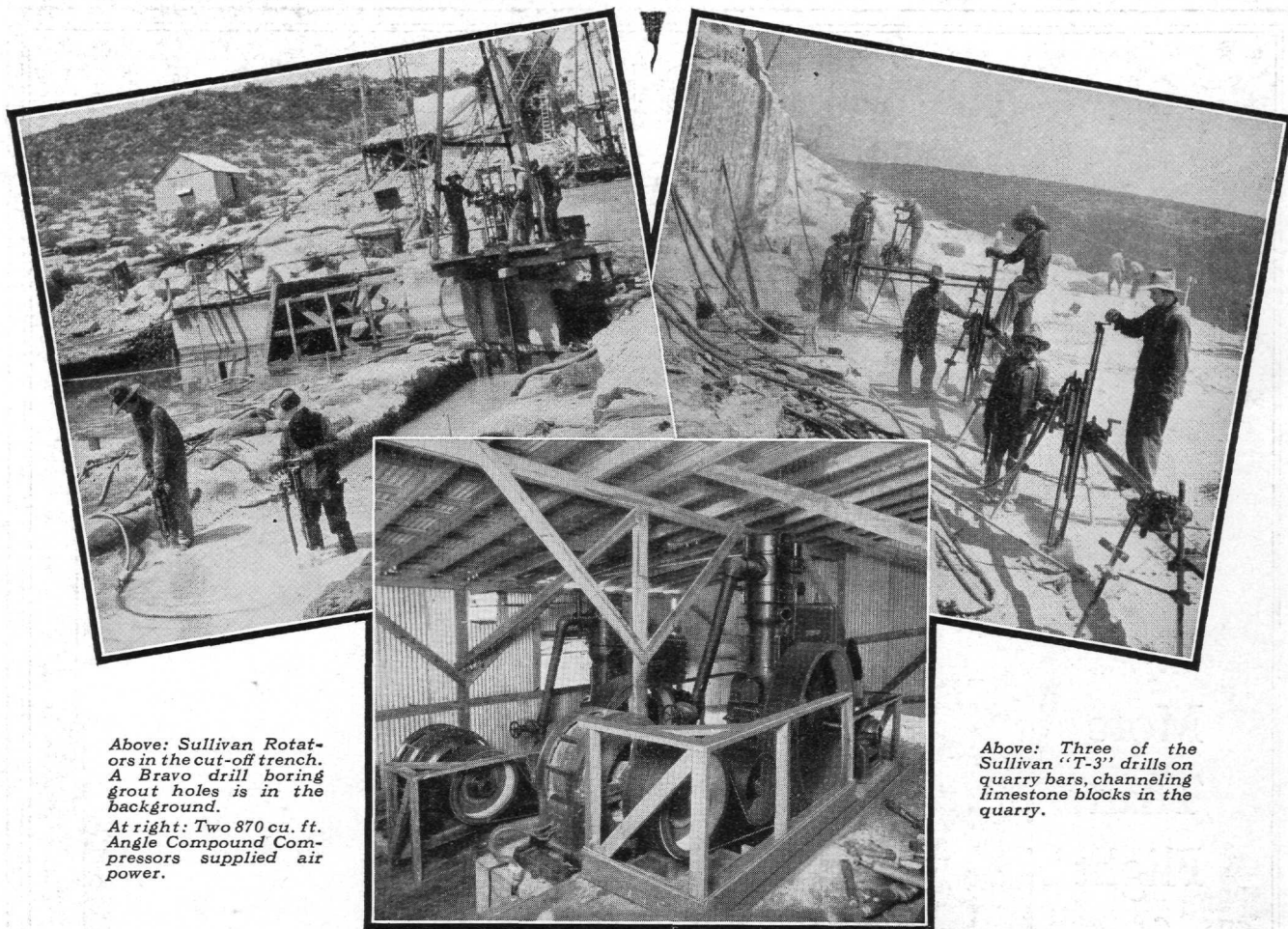
Office Buildings · Industrial Plants · Warehouses · Railroads and Terminals · Foundations
Underpinning · Filtration and Sewage Plants · Hydro-Electric Developments · Power Houses
Highways · River and Harbor Developments · Bridges and Bridge Piers · Mine Shafts and Tunnels

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BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES



Above: Sullivan Rotators in the cut-off trench. A Bravo drill boring grout holes is in the background.
At right: Two 870 cu. ft. Angle Compound Compressors supplied air power.

Above: Three of the Sullivan "T-3" drills on quarry bars, channeling limestone blocks in the quarry.

Modern Engineering Gives Electricity to the plains of West Texas

WITH the discovery of oil, West Texas needed electric power. And now, in the heart of the mesquite plains around Del Rio—the first hydro-electric dam has been completed. It is 900 feet long, and 45 feet wide, and will harness the waters of Devil's River.

In building the dam, modern engineering overcame one after another of nature's obstacles.

Sullivan Diamond Drills took 2-in. cores 50 feet deep in the bedrock to determine its safety for the dam; and to reveal seams, which later were filled with cement to prevent seepage, underneath.

No sand for concrete was available—so lime-

stone blocks were chiselled from the river bank, to form the dam. Line drilling with Sullivan Rock Drills and quarry bars, removed the blocks from the quarry. Eight of these rigs drilled 28 miles of hole in one month.

When the limestone blocks were in position, the Diamond Drills bored holes through which cement grout was pumped, to fill up cavities and crevices.

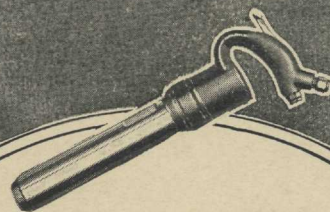
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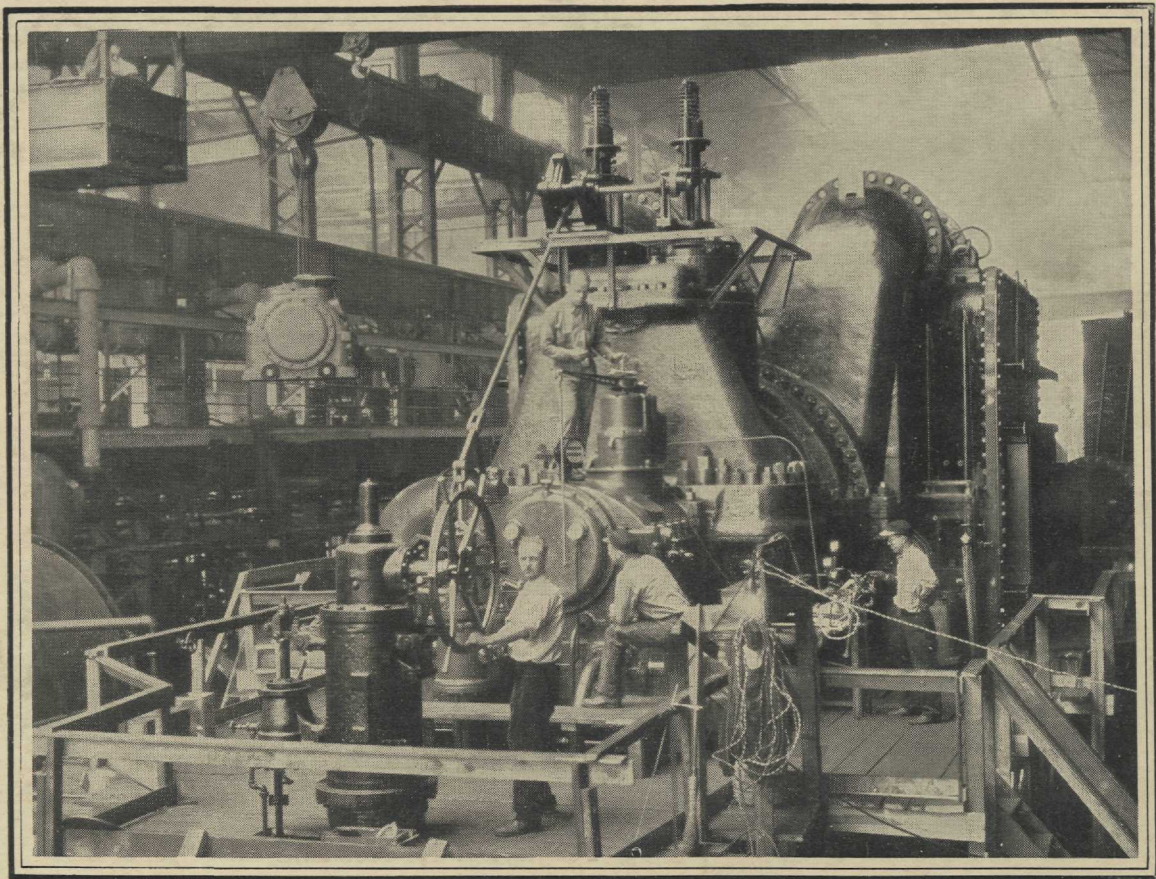
Few, however, understand the important work that falls to the lot of other pneumatic tools. Chippers, drills, grinders, hoists—they replace hand labor in every trade and speed the output of all our present-day commodities.

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“Kick it Over”

“How’s the oil, Ed?”

“O. K.”

“All right, Bill, kick it over.”

A valve is opened; a rush of steam strikes a myriad of buckets, and one of the largest turbines ever built—a thousand tons of delicate machinery valued at nearly two million dollars—makes its initial run in the Schenectady shops of the General Electric Company.

Under the direction of senior “test men,” young engineers—college students last year—dart around the whirling giant, listening for rubs, recording temperature, and feeling vibrations. It is their job to test this great generating plant in order that it will operate efficiently on delivery.

Here is responsibility to test the mettle of any man.

Every day, such responsibilities are given to hundreds of young college graduates “on test” at the General Electric Company. Here, future leaders of the electrical industry are in the making—eagerly preparing to direct and broaden the use of electricity in the home and in industry.



Not only on giant generators, but on hundreds of electrical adaptations, the General Electric monogram is a symbol of the skilled engineering and high manufacturing quality which have made General Electric a leader in the great electrical industry.

GENERAL ELECTRIC

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